

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. (Currently Amended) An imaging system comprising
  - a) a nuclear spin tomography device capable of obtaining data for locally-resolved imaging of the magnetic resonance behavior of the atomic nuclei in a selected field of view in a body, the device being made and programmed such that the body can be exposed by the device to high frequency and magnetic field gradient echo pulse sequences that are spatially coded in each direction of space and that produce magnetization in a body such that the magnetization of a medium that is flowing in at least one direction in space in the body can be attenuated by dephasing the spins of the atomic nuclei in the medium, wherein the gradient echo pulse sequences are calculated such that an additional gradient contribution in each direction in spacial space in which the medium is flowing in the body is added to a the gradient echo pulse sequence needed for said spacial spatial coding in each direction of space without influencing the said space coding, the gradient moment of the first order,  $M_1$ , of the respective gradient echo pulse sequence being maximized by setting the gradient field intensity and the slew rate to a respective maximum value, and the gradient zero order moment,  $M_0$ , of said gradient echo pulse sequences needed for said spatial coding being essentially unchanged by said additional gradient contribution,  
b) an MR contrast medium that is taken up by the body.

2. (Previously Presented) A system according to claim 1, wherein the magnetization of the medium flowing in at least one direction in space in the body can be attenuated by dephasing of the spins by maximizing gradient moments of order  
i  $M_i(t)$  in such direction in space according to the following relation:

$$M_i(t) = y \cdot \int_0^t G(t') \cdot t'^i dt'$$

wherein

- i is an integer greater than zero,

$\gamma$  is the gyromagnetic ratio of the atomic nuclei,  
 $G(t')$  is a time-dependent gradient field intensity in such direction in space and

$t$  is the time interval that has passed since the emission of a high frequency pulse for excitation of the atomic nuclei.

3. (Previously Presented) A system according to claim 2, wherein the magnetization of the medium flowing in at least one direction in space in the body can be attenuated by dephasing of the spins by maximizing gradient moments of the first order  $M_1(t)$  in such direction in space according to the following relation:

$$M_1(t) = \gamma \cdot \int_0^t G(t') \cdot t' dt'$$

4. (Currently Amended) A system according to claim 1, wherein gradient echo pulse sequences ~~can be~~ are produced in the respective directions in space by inserting ~~the~~ flow dephasing gradient pulses into flow-compensated imaging gradient echo pulse sequences.

5. (Previously Presented) A system according to claim 4, wherein  $M_1$  satisfies the following relation:

$$M_1(t; G_{bipolar}, tramp, t_{plateau}, t_{sep}) = \gamma \cdot G_{bipolar} \cdot (tramp + t_{plateau}) \cdot (2tramp + t_{plateau} + t_{sep})$$

wherein

$\gamma$  is the gyromagnetic ratio of the atomic nuclei,  
 $G_{bipolar}$  is the maximum gradient field intensity,  
 $Tramp$  is rise/fall time when the gradient field is turned on/off,  
 $t_{plateau}$  is the time interval during which  $G_{bipolar}$  is reached, and

*tsep* is the time interval between two gradient pulses.

6. (Previously Presented) A system according to claim 1, wherein the device comprises

- a static magnet,
- gradient devices for producing gradient pulses in three directions in space that are orthogonal to one another,
- a transmission device for producing high frequency signals,
- a receiving device for high frequency signals,
- a device for triggering gradient devices and the transmission device,
- an evaluation device, and
- a display device.

7. (Previously Presented) A system according to claim 1, wherein the MR contrast medium can be administered intravenously to a human or animal body.

8. (Previously Presented) A system according to claim 1, wherein the MR contrast medium is lymph-passable and/or plaque-passable.

9. (Currently Amended) A process for locally-resolved imaging of the magnetic resonance behavior of atomic nuclei in a selected field of view in a body in which data from the field of view are obtained by means of using a nuclear spin tomography device by which the body being is exposed to high frequency and magnetic field gradient echo pulse sequences that are spatially coded in each direction of space and that produce magnetization in the body such that the magnetization of a medium flowing in at least one direction in space is attenuated in the body by dephasing of the spins of the atomic nuclei in the medium and by an MR contrast medium being supplied to the body, wherein the gradient echo pulse sequences are calculated such that an additional gradient contribution in each direction in spacial space in which the medium is flowing in the body is added to a the gradient echo pulse sequence needed for said spacial spatial coding in each direction of space without influencing the said space coding, the

gradient moment of the first order,  $M_1$ , of the respective gradient echo pulse sequence being maximized by setting the gradient field intensity and the slew rate to a respective maximum value, and the gradient zero order moment,  $M_0$ , of said gradient echo pulse sequences needed for said spatial coding being essentially unchanged by said additional gradient contribution.

10. (Previously Presented) A process according to claim 9, wherein the magnetization of the medium flowing in at least one direction in space in the body is attenuated by dephasing of the spins by maximizing gradient moments of order  $i$   $M_i(t)$  in such direction in space according to the following relation:

$$M_i(t) = \gamma \cdot \int_0^t G(t') \cdot t'^i dt'$$

wherein

$i$  is an integer greater than zero,

$\gamma$  is the gyromagnetic ratio of the atomic nuclei,

$G(t')$  is a time-dependent gradient field intensity in such direction in space and

$t$  is the time interval that has passed since the emission of a high frequency pulse for excitation of the atomic nuclei.

11. (Previously Presented) A process according to claim 10, wherein the magnetization of the medium flowing in at least one direction in space in the body is attenuated by dephasing of the spins by maximizing gradient moments of the first order  $M_1(t)$  in such direction in space according to the following relation:

$$M_1(t) = \gamma \cdot \int_0^t G(t').t' dt' .$$

12. (Currently Amended) A process according to claim 9, wherein gradient

echo pulse sequences are produced in the respective directions in space by inserting the flow dephasing gradient pulses into flow-compensated imaging gradient echo pulse sequences.

13. (Previously Presented) A process according to claim 12, wherein  $M_1$  satisfies the following relation:

$$M_1(t; Gbipolar, tramp, tplateau, tsep) = \gamma \cdot Gbipolar \cdot (tramp + tplateau) \cdot (2tramp + tplateau + tsep)$$

wherein

- $\gamma$  is the gyromagnetic ratio of the atomic nuclei,
- $Gbipolar$  is the maximum gradient field intensity,
- $Tramp$  is rise/fall time when the gradient field is turned on/off,
- $tplateau$  is the time interval during which  $Gbipolar$  is reached, and
- $tsep$  is the time interval between two gradient pulses.

14. (Previously Presented) A process according to claim 9, wherein the MR contrast medium is administered intravenously to a human or animal body.

15. (Previously Presented) A process according to claim 9, wherein the MR contrast medium is lymph-passable and/or plaque-passable.